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dogs the author finds, as Waller found for the nerves of frogs, that the first straight portion of the curve is preceded by a short curved portion, convex toward the abscissa. The point of interest for psychophysics lies in the fact that, so far as inference from these experiments is justifiable, the relation of stimulus and sensation generalized by Weber's law (which many have considered a matter of neural physiology) lies in the activity of some other portion than the nerve fibre.

E. C. S.

The Functions of the Ear and the Lateral Line in Fishes. FRED-ERIC S. LEE. American Journal of Physiology, I. (1898), 128-144.

As a basis for discussing the relation of the ear and the organs of the lateral line Dr. Lee summarizes the results of his admirable studies on the equilibration sense and the ear, already published, together with others not as yet published in detail. The ear of fishes performs both dynamical and statical functions. The dynamical are: First, recognition of rotations (mediated by the semicircular canals and their nervous mechanisms), and second, recognitions of movements of translation (mediated by the otolith organs of the utricle, saccule and lagena). The statical function, recognition of position in space (gravity sense), is also mediated by the otolith organs. An ear might seem to imply hearing, but this is not the case in fishes,—Lee's experiments, like those of Bateson and Kreidl, showing these creatures to be without hearing in the ordinary sense of the word, though sensitive to jars.¹

Lee has also experimented on the lateral line organs in dog-fish, toad-fish and butter-fish with results that point strongly to an equilibrative function as that of these organs also, which agrees with the morphological derivation of the ear from a specialized group of these line organs.

What has probably been the evolutionary history of the developed ear of higher forms is thus sketched by the author: "The primitive function, not improbably, was the appreciation of movements of the water against the body and movements of the body in the water, combined with appreciation of contact, and, hence indirectly and crudely, of position in space; by the exercise of this function, through functional connection with the locomotor mechanism, the equilibrium of the body was maintained. In some unknown way a bit of this sensory system became cut off from the rest and enclosed within the skull; it still retained its power of appreciating bodily movements and contact, and this power became refined and differentiated; the capacity of appreciating rotary movements was separated from that dealing with progressive movements and position in space, and the two were associated with distinct organs, the semicircular canals on the one hand, and the otolith organs on the other, which were appropriately constructed to subserve their respective functions. Thus, a well-marked sensory organ for equilibrium was evolved in fishes. When aquatic animals began to leave the water and live a shorter or longer time upon the land, and the possible advantage of a sense of hearing was presented, a portion of this sensory organ of movement became still farther differentiated; a new patch of sensory nerve-terminations

¹ Lee summarizes one of Kreidl's studies as follows: "In a subsequent paper Kreidl explodes the oft-repeated tale of hearing by fishes that come for their food at the sound of a bell, by investigating carefully the action of trout at the famous old Benedictine monastery in Krems, Austria. He proved that the fishes come because they see the man who brings the food, and appreciate the vibrations of the water caused by his step and communicated through the stone basin; and that, when these are excluded, the sounds of the bell have no effect."

appeared, the papilla acustica basilaris; apparatus for conveying the waves in the air directly to the membranous ear was developed; and thus the power of appreciating the movements we call sound was acquired." E. C. S.

I limiti del pudore nell'uomo e nella donna. Pio VIAZZI. Riv. mens. di Psich. forense, Antrop. crim., ecc. (Napoli), Vol. I (1898), pp. 164-175.

In this article, Viazzi, the author of a work on "Sexual Criminals," in which he sustained in detail the view that woman has a greater sense of shame than man, abandons that opinion, returning to the conviction of Sergi, that by reason of her less amorous sensibility, woman has necessarily less sense of shame than man, though she *seems* to evince and to display more. Woman's use of shame as a means of seduction,—shame in the sense of hiding or avoiding what would excite repugnance or disgust and endanger her amorous conquests; the graver consequences for her of the *côitus* and the social consequences of unchastity and infidelity, which cause not a little calculation to enter into her sense of shame, until ultimately it departs from the sphere of feeling and enters the region of deliberate reasoning as to consequences of lack of shame; the greater interest woman has over man in showing herself modest and shamefaced—all this lessens the amount of real shame-sense to be attributed to the female sex. A great deal of her apparent shame is merely the clever psychical counterfeit. The pallid frigidity of woman on certain occasions, may be the shadow of shame, but only the ghostly shade. Man's wider range of sexual reactions (shown also in the pathological side of love and its fetichisms) carries with it a greater bulk of shame. Low-necked dresses and exposed breasts still wait their analogues in the drawing room and the theater from men. Women are led to be shameless more easily than men, and shameless in public. For evolutionary reasons, a deeply-felt sense of shame, an organic sense of it are naturally stronger in the sex, whose ego is best protected and defended.

A. F. C.

Il dolore nell' educazione. L. M. BILLIA. Nuovo Risorgimento, Vol. VIII (1898), pp. 187-193.

The question whether man is free or not seems to be settled by the answer to the question: Can he inflict pain upon himself for a certain end? Not every pain, or all pain is educative, but without pain there can be no greatness, no virtue, no true happiness, no work, no science, no education. Study is pain, thought is pain, pain is virtue.

A. F. C.

The Origin of the Family. H. SOLOTAROFF. American Anthropologist, Vol. XI (1898), pp. 229-242.

The primary form of the family, according to M. Solotaroff, is "the mother free to contract or dissolve sexual bonds—and the group of children resulting from these sexual relations." The assertion of man's bio-psychic activities and individualities, and the growth, with the vicissitudes of environments of the need of sexual favors, help and protection for herself and her children "have led the woman slowly out of bondage of economic care for her family group, but led her into marital bondage, while the most powerful tendency toward socialization among primitive men, expressing itself in various ways, has incidentally expressed itself, also, in occasional sexual permissuity as the outcome of the ecstasies of play—one of the most potent instincts of the social sentiment." In his general views the author approaches Westermarck, rejecting the theory of primitive promiscuities.

A. F. C.